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# SANITARY COMMISSION.

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## REPORT

OF A

COMMITTEE OF THE ASSOCIATE MEMBERS OF THE

SANITARY COMMISSION

ON

## DYSENTERY.



PHILADELPHIA:  
COLLINS, PRINTER, 705 JAYNE STREET.  
1862.

Feb 1862

THE attention of the Sanitary Commission has been called to the fact that most of our Army Surgeons now in the field are unavoidably deprived of many facilities they have heretofore enjoyed for the consultation of standard medical authorities. It is obviously impossible to place within their reach anything that can be termed a medical library. The only remedy seems to be the preparation and distribution, among the medical officers of the army, of a series of brief essays, or hand-books, embodying, in a condensed form, the conclusions of the highest medical authorities in regard to those medical and surgical questions which are likely to present themselves to surgeons in the field, on the largest scale, and which are, therefore, of chief practical importance.

The Commission has assigned the duty of preparing papers on several subjects of this nature to certain of its associate members, in our principal cities, belonging to the medical profession.

The following paper on *Dysentery* belongs to this series, and is respectfully recommended by the Commission to the attention of medical officers.

FRED. LAW OLMSTED,

*Secretary.*

WASHINGTON, Feb. 1862.

## REPORT ON DYSENTERY.

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THE experience of recent as well as remoter times shows that the two great causes of death in armies are typhus, with its allied forms of fever, and DYSENTERY. It also proves that, when they are most fatal, all of these diseases arise from the neglect of well-established sanitary rules, and that their ravages are least destructive whenever an intelligent appreciation of their forms, grades, and complications governs their treatment. This is emphatically true of dysentery. "Camp dysentery" is far from being uniformly the same. It may vary in type as greatly as dysentery does in civil life, presenting all shades of difference from a slight and transient bowel complaint, with scarcely any general symptoms, to a violent inflammatory affection, or a malignant and putrid fever. It is the object of this Report to remind the army surgeon of these fundamental diversities of type, and of the very different methods of treatment which they render necessary. Appropriately to fulfil it, all that is essential in regard to the description, causation, treatment, and prevention of dysentery must be reviewed as fully as the practical purpose of the paper will permit. In doing so we shall confine ourselves to those pathological facts which have a direct relation to the treatment and prevention of the disease, leaving entirely aside the more or less speculative discussions which the inquiry may suggest.

MORBID ANATOMY.—On opening the abdomen after death by dysentery, the relative positions of the intestinal folds is

often altered; the colon is most apt to be displaced, its transverse portion occupying the pelvis; and invaginations of the large as well as of the small intestine are frequent. Sometimes the peritoneum is injected, and in very rare cases inflamed. Perforation of the bowel is extremely unusual. The contents of the colon are fecal and mucous in the first stage; but later consist of epithelium, a jelly-like exudation, false membrane, blood, and pus. The mucous membrane in the small intestine is generally unaltered; but in the large its color is of various shades, from a rosy red to a dark brown or even black, and is more or less softened in recent cases. Sometimes large fungous granulations occupy the whole area of the ulcerated surface. In some violently acute cases of certain epidemics there is a wide spread exudation of false membrane, while the tissue beneath is more or less gangrenous or sloughing. But more commonly the characteristic lesion is chiefly displayed by the mucous follicles. In the earliest stage of the simple acute, and later in cases of the subacute form, there is, along with a general redness and swelling of the mucous membrane, an enlargement of its follicles by the deposit within them of a grayish or yellowish granular matter, which, by its increase, appears to determine the ulceration of the follicles themselves, and of more or less of the surrounding mucous membrane, and of the subjacent cellular and even the muscular coats of the intestine. During this process the connective tissue grows thicker and more dense, as if to resist the advance of the ulcerative process. Between the follicles the mucous membrane may also be destroyed by the extension of ulceration from them, by primary softening, or, as already intimated, by gangrene. The first is the most usual manner. As a consequence, large portions of mucous membrane may be removed, leaving the cellular coat bare, or partially covered by islands of mucous membrane. On opening the bowel these are very apt to be mistaken for pseudo-membranous deposits, and the denuded cellular coat for the healthy mucous membrane. Owing to the manner in

which the intestinal ulcers are formed in dysentery they have usually a circular shape, and often the edges are as sharp as if pieces had been cut from the mucous membrane with a punch. In healing, the smaller ulcers fill up from the bottom, while the edges advance inwardly, and gradually the cavity is obliterated; but it is doubtful if a true epithelial coating is ever formed anew. Larger ulcers contract in healing, and form a tough fibroid cicatrix which has a puckered aspect.

The ulcers which have been described are always most numerous in the rectum, and also more perfectly formed there than in the upper portions of the large intestine. Indeed, it is evident from an examination of cases fatal at different periods of the disease, that the ulcerative process begins at the lower part of the bowel and gradually advances upwards. In the rectum it sometimes completely destroys the mucous membrane, while in the superior divisions of the colon the ulcers are fewer and less profound. They seldom exist in the small intestine unless in cases complicated with typhoid fever. The mesenteric glands are enlarged and softened and sometimes contain pus.

In *chronic* dysentery the mucous membrane of the colon is generally very much thickened, and is studded with ulcers in various stages of cicatrization, and presenting appearances depending upon the type of the disease. The simplest form is that in which the ulcerative process has been uncomplicated with exudation. Here the ulcers may be of regular shape with rounded and thickened edges and a whitish surface; or their edges may, by their puckered aspect, denote a tendency to healing; or large and irregular ulcers may occupy the greater part of the circumference of the intestine, exposing the muscular coat and its hypertrophied fibres, a condition, indeed, which may affect the whole extent of the rectum; or finally, at a more advanced stage still, the healing of extensive ulcers may occasionally produce a contraction or stricture of the bowel. In all of these cases abscesses in the cellular substance around the rectum are not uncommon.

The exudation which has been referred to as belonging to certain grave forms of acute dysentery may, if the disease is greatly prolonged, become closely adherent to the mucous membrane, and even acquire a vascular connection with it, so that the raw surface which it leaves on being removed presents the appearance of an ulcer. The false membrane itself is even susceptible of taking on the ulcerative process. It sometimes, also, assumes a fungous character and projects above the surface of the surrounding membrane. In very chronic forms of the disease, melanotic deposits are met with in the mucous membrane around healed ulcers, and elsewhere; and in some cases the mesenteric glands are found to have undergone calcification. From this brief sketch of the lesions in dysentery it will be understood that although ulceration of the bowel is seldom absent, on post-mortem examination, there is necessarily an inflammatory process which precedes the loss of substance. In some cases of very rapid death from the typhoid form of the disease no ulceration has been detected, simply because time for its occurrence was wanting. Even the presence of blood in the stools is an insufficient proof that ulcers of the intestine exist. The practical value of this statement becomes apparent when we consider how much the efficacy of an appropriate treatment must be increased, if it is applied in the forming stage of the disease, before any injury to the structure of the intestinal mucous membrane has taken place.

DEFINITION AND FORMS OF DYSENTERY.—Anatomically, dysentery is an inflammation of the follicles of the rectum and colon. Symptomatically it is a febrile affection characterized by colicky abdominal pain (tormina), a constant and urgent desire to go to stool (tenesmus), and scanty mucous and bloody discharges. Nosologically, or according to its nature as a disease, it is a peculiar poisoning of the blood manifested by fever, and nervous disorder or depression, and a follicular inflammation of the large intestine. Of this last proposition a sufficient proof is the total

want of proportion between the local lesions and the constitutional symptoms. The latter not only precede the former, but may even prove fatal before the lesion of the intestine has developed itself. According to this view, which is suggested especially by the epidemic form of the disease, dysentery is analogous to typhoid fever rather than to the intestinal irritation produced by acrid substances, and by piles, fistula, and similar local affections of the rectum; for as in typhoid fever of a grave type the general phenomena predominate, and death itself may occur before any ulceration of Peyer's glands takes place, so in dysentery a fatal issue may be quite independent of intestinal changes, but present, on the other hand, all the evidences of blood poisoning. But while we must recognize in dysentery a specific nature demonstrated by the uniform occurrence of a characteristic lesion, whenever time is given for this to form, we must admit that the whole symptomatic livery, or type of the disease is under the control of external circumstances; that under particular conditions it presents typhoid symptoms; in others bilious; in others, again, periodical phenomena, all of which may be superadded to or modify the essential characters of simple dysentery. It results from these facts that the essential phenomena of dysentery may become of far less importance than those which its accidental type impress upon it; that the latter may determine its degree of gravity, and even indicate a treatment directed not so much against the intestinal symptoms and presumed lesions, as against the diathesis, or constitutional state which overlies them.

For convenient study dysentery may be divided into *Acute* and *Chronic*, and the acute form into *Mild*, *Sthenic*, *Bilious*, and *Malignant*. Of the *Periodical* variety a few words will also be said.

*Mild Acute Dysentery*.—The earliest symptoms of this affection are general malaise, soreness or pains in the back and limbs, debility, anorexia, and sometimes nausea and colic, and frequent calls to stool without any evacuation. But, in other cases,

diarrhœa, which is generally slight, may exist for several days before the more characteristic bowel complaint, and be itself not unfrequently preceded by constipation. The calls to stool become, however, more frequent and the discharges more scanty; they are immediately preceded by borborygmi and colicky pains in the abdomen, and accompanied by a sense of weight in the perineum and anus, a painful straining or bearing down, and the passage of small quantities of fecal matter mixed with jelly like mucus, tinged with blood, diffused or in streaks or small clots, and scalding the anus in its passage. Sometimes pure blood is discharged, particularly by persons subject to piles. The number of such stools varies from six or twelve to twenty-four every day. The abdomen is not usually tender, nor is the colic or the bearing down very severe. The heat of skin is moderate or scarcely perceptible; the pulse slightly quickened; the tongue whitish but moist; the appetite may be null, but is not always lost, and the thirst is moderate; but tormina and tenesmus are excited by all kinds of food except the very mildest. In this form an attack of dysentery is of one or two weeks' duration, and terminates by the gradual return of the alvine discharges to their feculent condition, and a copious lateritious deposit in the urine. Simultaneously a full perspiration is sometimes observed as a critical phenomenon.

*Sthenic Dysentery.*—This form of the disease is distinguished by the full development and sthenic nature of the characteristic symptoms, which are eminently those of an inflammation of the rectum and colon. It generally commences with a well-marked chill, followed by a hot skin and a full and frequent pulse. More rarely than in the milder form, is it preceded by simple diarrhœa, or, if this occurs, it is more vehement, and is accompanied with nausea, and even vomiting. With the reaction from the chill the face becomes flushed, especially on the cheeks, and the eyes are injected, while the frequent and tense pulse, the severe headache, and urgent thirst denote a high grade of fever. Colic

of a very severe description and almost unremittingly, is experienced; and the abdomen, which is often tense and hard, but not necessarily distended, is very sensitive to pressure, especially in the left iliac region. Severe contusive or aching pain is also felt in the loins, extending to the thighs. But the chief cause of suffering is tenesmus, which in many epidemics is almost uninterrupted, and becomes excruciating while the patient strains at stool. It is, in some cases, nearly constant, even when nothing is voided, and the expulsive efforts bring on a protrusion of the mucous membrane of the rectum. The sensation is sometimes said to be as if a burning iron were thrust into the bowel. It is important to be noticed that the extreme degree of pain here described is by no means an unfavorable symptom, but may perhaps be rather considered as a measure of the patient's power of resistance. The opposite condition, or complete inertia, is indicative of a much more serious danger. The quantity of matters expelled is in an inverse ratio to the frequency and the violence of the expulsive efforts, particularly at the height of the disease. Near its commencement profuse discharges of blood may take place, which, indeed, afford some relief; but later, the stools consist of blood mingled with dense stringy mucus, or with the fibrinous products of inflammation. These assume the form of shreds of false membrane, or of masses resembling suet, more or less intimately associated with blood. Yet even in this variety of the disease, blood is not always nor in large quantities found in the dejections, which are sometimes almost suppressed, and in other cases have a lumpy appearance resembling imperfectly-cooked gruel. This is the form in which the fibrinous exudation is most frequently discharged. As the disease advances, the stools have a fetid, sickening, or cadaverous odor, become more and more frequent, and at last are passed involuntarily, while the anus becomes exquisitely tender, and is surrounded by inflammatory redness.

In some epidemics such stools are at times mixed, or alternate

with others which are more or less green and frothy, particularly on the surface, and have been compared to the scum which is seen floating upon stagnant water. The number of the stools does not always gradually decline, but often they almost entirely cease, and, after an interval, are renewed with a temporarily increased frequency. But in general, this interval becomes longer as convalescence approaches.

Meanwhile there is extreme irritation of the bladder, and the scanty and high-colored urine scalds in its passage through the urethra. The thirst is intense, but all liquids, even the coldest, are apt to be rejected by the stomach, and to produce renewed paroxysms of tormina and tenesmus. Often a severe burning pain in the abdomen is complained of. At first the pulse is full as well as frequent, but rapidly assumes a tense, wiry, concentrated character. The voice is interrupted and weak. The tongue is sodden and thickly coated in the early stage of some cases, but afterwards is more frequently contracted, sharp, and very red, and gradually becomes dry, rough, fissured, brown or blackish, in unfavorable cases; but this condition is far from being constant; the features are sunken and sharp, the nostrils and lips become fuliginous, and a dark-red blush appears over the cheek bones. The skin of the whole body is harsh and dry. These symptoms are most marked in cases approaching a fatal termination, and, independently of any epidemic influence, may even merge into others which are characteristic of the adynamic or malignant form.

The duration of severe acute dysentery may be stated at two to three weeks.

*Bilious Dysentery.*—This form of dysentery should not be confounded with that in which the liver becomes secondarily affected with inflammation, tending to the production of abscess. The latter is almost exclusively met with in warm climates, and the fullest descriptions of it have been furnished by English practitioners in India, and French army surgeons in Algeria. But bilious dysentery, properly so called, is also frequently

observed in temperate climates, and often, but by no means exclusively, in malarious districts. Its predominant characters are gastric and hepatic disturbance and an excessive secretion of bile. It seldom assumes a distinct inflammatory and sthenic type, but, on the contrary, has a decided tendency to produce debility and exhaustion.

The invasion of bilious dysentery is apt to be marked by general coldness and extreme prostration, rather than by a rigor, properly so called. The sense of weakness is particularly referred to the back and loins. At the same time there is severe pain in the abdomen, with a bitter taste in the mouth, yellowish tongue, constant nausea and efforts at vomiting, with copious discharges of bile from the stomach. There is generally pain in the head, with vertigo, and irregular and transient chills, the pulse, meanwhile, being in some cases full and in others weak and thready. At first there is occasionally constipation, but more usually frequent and bilious stools, which are apt to continue for several days, when they become glairy and bloody; or blood may be mixed with the dejections from the beginning, and predominate in them more and more as the disease advances. These various degrees and kinds of admixture cause the color of the discharges to vary from pale to almost black. There is a peculiar tendency, also, to gaseous distension of the bowels, and the evacuated matters are extremely fetid, exhaling a putrid or cadaverous smell. This circumstance may be owing in part to the large quantity of altered blood which the bowels contain. The stools are very frequent, and may amount to one or two hundred in twenty-four hours, while thirty or forty are passed, even in the mildest cases. As might be expected from this circumstance tenesmus is sometimes constant and very distressing, and the urine scalds in passing. But neither of these symptoms is so frequent or severe as in the purely inflammatory form of dysentery. Intense thirst may be noticed as a prominent symptom. In the worst cases, the tormina and tenesmus are constant, even in the short intervals

between the evacuations, and even when the latter are abundant; but cessation of pain, excessive meteorism, and hiccup, are among the worst signs, to which may be added paralysis of the lower extremities, of the mouth, tongue, or organs of deglutition. The duration of bilious dysentery is less than that of the inflammatory form, a favorable termination frequently occurring within a week, in mild cases, and within a fortnight in the more severe. On the other hand, it may terminate fatally at a period as early as the shorter, or as late as the longer period, or even later, if an improper plan of treatment has been pursued in cases which tend naturally to a cure.

*Malignant or Typhoid Dysentery.*—The typhoid state is one which many acute febrile diseases assume, sometimes under inscrutable atmospheric influences, and sometimes under debilitating, exhausting, and depressing causes, both physical and mental, and such as abound in camps, on board ships, and in other places where human beings are crowded together. It seems not improbable that typhus fever (petechial typhus), is nothing more than this state in its simplicity, and carried to its extreme degree; for, in it no lesion of the solids can be found to explain its symptoms, except a tendency to disintegration, which depends upon a previous disorder of the blood. But in all other diseases which present more or less analogous phenomena, there is also a local structural lesion which accounts for their specific characters, and distinguishes them from typhus fever. Typhoid fever is a blood disease, with dothinententeritis, and a more or less marked predominance of the typhoid state; and typhoid pneumonia an inflammation of the lung, with the typhoid state superadded, and exerting a controlling influence on the local and general phenomena, and on the tendency of the local disease. The eruptive fevers are very prone to assume this state, because, it may be presumed, in them, as in typhoid fever, the primary morbid change is in the blood itself. It is reasonable to suppose that, if external circumstances favor, they will become complicated with that alteration of the circulating

fluid which is characteristic of typhus fever, and that they will be more apt to become so than affections whose primary seat is in the solid organs.

Now, observation teaches us that bowel complaints are more prevalent, as a general rule, than any other diseases in camps, barracks, hospitals, &c., because, in them the direct exciting causes of these complaints abound; from observation we also learn that in such places, under circumstances peculiarly unfavorable to a vigorous performance of the functions, that all diseases, and those especially which affect the whole œconomy, tend to assume the typhoid type; and, finally, we know that when these latter causes are greatly in excess, cases of pure typhus prevail. In other words, the intensity of the cause becomes so great, that instead of merely displaying its action upon those already sick, and furnishing a typical physiognomy to other affections, the typhous poison is powerful enough to generate its peculiar phenomena in persons merely enfeebled, but not yet specifically diseased. Consequently, there have been epidemics of diarrhœa, dysentery, pneumonia, intermittent fever, typhoid fever, and typhus, simultaneously in the same camp, hospital, or town, in which it seemed difficult to determine which was the original, and which the superadded affection, so intermingled did the periodical and the typhous phenomena become with one another, and with those which belonged to the local lesions of several of the affections. An attentive analysis will, however, generally reveal which of the symptoms of any given case are owing to a local and material morbid change, and which must be attributed to the general blood or nerve disease. Or, if the type affection predominates in all the phenomena occasioned by the local disorder, it will still be possible to distinguish both the one and the other, as we do the physical properties of a substance through a coating of varnish that invests it.

Typhoid dysentery is, then, in its simplest form, a variety of dysentery in which the phenomena of the typhoid state are superadded to those which are characteristic of dysentery. To

this alone the following description applies. The more complex cases will be alluded to under the head of *Complications*.

In the great majority of cases diarrhoea precedes the proper dysenteric symptoms for some time, particularly among those who have been subjected to the influence of debilitating causes. When these have been in operation for a considerable time, the patient rapidly acquires a cachectic appearance upon the super-vention of the dysenteric symptoms proper, if not before, the skin becoming muddy and pale, or mottled also with ecchy-moses, the hands and feet œdematous, and the countenance sunken and listless. In whatever degree these phenomena present themselves, the dysenteric affection is accompanied at its very outset with extreme, and often sudden, prostration, oppres-sion at the epigastrium, and a rapid increase of the evacuations. At first the mind is clear, or, if delirium is present, it is usually of the tranquil sort, but in exceptional cases is maniacal. More generally the expression is stolid, vacant, careless, or apparently thoughtful; questions are answered but slowly, and there is no real delirium, until the approach of death. In some cases, how-ever, there is incessant agitation, change of posture in bed, com-plaint of the weight of the bedclothes, or of burning heat in the abdomen, while the surface of the body is quite cool to the touch, or the patient curls himself up in the middle of his bed and refuses to be disturbed.

The voice is very faint and swallowing difficult, and some-times there is vomiting not only of liquids that have been taken but even of blood. Retching is very frequent, or a movement between that and hiccup, and may be excited by anything swallowed, even by a few drops of water. Upon pressure the abdomen is sometimes complained of, particularly at its lower part; but although spontaneous pain is occasionally very severe, such is not frequently the case. The stools vary in number and quality. Sometimes they are few, sometimes almost constant; they are accompanied occasionally with excruciating tenesmus, but are often discharged without either effort or pain. They

are most frequent at night, and are excited by swallowing food. Their qualities are extremely various. Often brown and mixed with mucus, or even scybalous; or watery and tinged with blood; or apparently formed entirely of decomposed blood; they are in some cases grayish-white or chalky looking, or sanious, and exhale a horribly sickening cadaverous odor. These characters may vary in successive evacuations, and, particularly, stools containing the products of inflammation may alternate with others of a more or less fecal character.

The urine is generally scanty and irritating, and occasions scalding in the urethra and strangury, and in some cases with a fatal tendency it is altogether suppressed. It may assume a brown color, due probably to dissolved blood-globules, and this is a grave indication. The same remark applies to a fetid odor exhaled by the urine, the breath, sputa, or perspiration, to a persistently bad, putrid, or saltish taste in the mouth; to great and craving thirst, or a sense of dryness in the mouth, when the tongue is moist, and to clamorous demands for drink in spite of its rendering the stools more frequent.

In general the skin is dry and scaly, but it may also have a cold and sticky feel; and the nose, hands, and feet are often cold. Even when general perspiration occurs it is seldom critical. Petechiæ and vibices may form, particularly upon the legs and arms; pustules, blebs, and miliary vesicles are not unusual, and may be followed by ulcers. The gums may be swollen, dusky red, or bleeding; and bleeding from the nose is not unusual. The pulse is feeble, but its natural frequency is often unchanged materially. If it much exceed one hundred per minute the accompanying prostration is very great, or some complication (peritonitis usually) is forming. With the progress of the disease the hiccup, dysphagia, and debility increase; the abdomen often swells, and the stools are passed involuntarily and unconsciously; the tongue becomes incrustated and the teeth are covered with dark and sometimes bloody sordes; gangrene may attack the feet or parts subjected to

pressure; and death takes place by exhaustion. If the disease is fatal at an earlier stage coma or delirium may attend its close, which is sometimes hastened by erysipelas.

COMPLICATIONS.—The most important general diseases which complicate dysentery, especially in its epidemic form, are *typhus* and *typhoid fever*, *intermittent fever*, and *scurvy*.

In reference to the two *forms of fever* first mentioned, little need be added to what has already been said, except that they more or less obscure the dysenteric symptoms during their continuance; but if the patient survives their decline, those symptoms reappear, and by their peculiar gravity rapidly exhaust the powers of life. In cases of dysentery to which one of the other diseases has been superadded, the intestinal lesions do not appear to have their progress suspended, although the diarrhœa may have ceased or become very slight as well as the tenesmus. After life has been rapidly extinguished, with exhaustion by frequent thin, watery, serous, sanious, or bloody stools of an excessively fetid character, and the other indications of a devitalized blood and disintegrated solids, the mucous membrane of the large intestine is often extensively and deeply ulcerated, dark and even gangrenous, and sometimes there are found, besides, in the small intestine the characteristic lesions of typhoid fever. But, we repeat it, the clinical history of such cases is often extremely obscure.

Epidemics of dysentery in malarious districts are, in common with many other affections with a local lesion, more or less influenced by the cause of *periodical fevers*. Not only do these predispose to attacks of the former disease, but it would seem that the predisposing causes of the one, such as cold, dampness, and fatigue, tend to develop the other. Not unfrequently an attack of dysentery suspends the intermittent paroxysms, which return upon its decline. In some cases the two affections occur simultaneously, and the dysenteric symptoms present periodical exacerbations; in others the phenomena of the paroxysms of

intermittent fever are dysenteric, the intermission being free from the symptoms of both affections. The latter form is by far the least frequent.

The complication of *scurvy* usually precedes the development of the dysenteric affection, and accompanies or is preceded by the diarrhœa which has been referred to as the ordinary antecedent of camp dysentery. Its proper symptoms are paleness, emaciation, and extreme lassitude or aversion to labor, dejection of spirits, pains in the loins and limbs, spongy and bleeding gums, and purplish and livid specks or spots or indolent ulcers upon the legs, which also become œdematous, and cold and stiff. There is at the same time an aversion or indifference to food, and the pulse is small and feeble. If diarrhœa exists, as it usually does, the stools are by turns bilious, watery, or bloody, and sometimes consist of pure blood. Upon the super-vention of dysentery with its abdominal pains, tenesmus, and more frequent stools, the scorbutic symptoms proper, if slight, are not always aggravated, but are rendered more intractable; but if already well developed they coincide with those of the dysentery itself, and the union of the two morbid processes rapidly undermines the strength by completely subverting the reparative functions of the economy. Generally the complex disease then assumes the form of typhoid dysentery, with an aggravation of all the symptoms which depend upon a dissolution of the blood.

Among the other complications, and which need not here be described, because they do not form any proper union with the dysenteric symptoms, are *rheumatism*, *diphtheria*, and *parotitis*. The first may alternate with dysentery or rather be suspended during the progress of the bowel affection; the second is a grave occurrence in all the forms of the disease, but especially in the typhoid, which it is most apt to complicate; and the last, which most frequently occurs during the decline of the attack, is least dangerous when it terminates in suppuration, and most so when it suddenly or very rapidly subsides.

*Abscess of the liver* is a frequent complication of dysentery in warm climates and particularly among drunkards. In this country, even in the Southern States, it appears to be rarely met with.

CONVALESCENCE. CHRONIC DYSENTERY.—Dysentery is peculiarly subject to relapses, even after its mildest attacks, unless great care be taken of the patient's regimen. The simplest form, indeed, if not very improperly treated, is followed by a speedy return to health, but even slight errors of diet will occasion abdominal pain and diarrhoea and perhaps some tenesmus. Graver forms have a protracted convalescence marked by great debility, a slow return of flesh and strength; indigestion; constipation and scybalous stools alternating with tenesmus and diarrhoea, and sometimes loss of power in the sphincter ani. A tendency to sweating, particularly at night, is frequent; the hair is apt to fall out; boils may form in various parts of the body; and abscesses about the anus and hemorrhoids are not uncommon. If the patient remains in the place where the disease was contracted, the cure of severe dysentery is slow and difficult even under the most appropriate regimen, and without this a relapse may occur even after his removal to a more salubrious locality. The intestinal ulcers do not completely heal, and the discharges are more or less constantly mucous, serous, purulent, or bloody; the food passes rapidly through the bowels and is often discharged undigested; emaciation is persistent and extreme and accompanied with hectic symptoms; and occasionally perforation of the bowel near the sigmoid flexure of the colon takes place. More frequently thickening affects the coats of the bowel in this region, forming a stricture. These are the prominent phenomena of *chronic dysentery*.

*Duration*.—Simple acute dysentery of a mild type lasts from one to two weeks before complete convalescence is established, and the severer inflammatory forms, if uncomplicated, run

their course in from two to three weeks. But these are only approximative terms. The graver and complicated varieties of the disease may terminate fatally within a few days, and the least severe, if improperly treated or in unfavorable circumstances, may be indefinitely prolonged and become chronic.

*Diagnosis.*—As stated in the definition, tormina, tenesmus, bloody stools and fever form a group of symptoms peculiar to dysentery. It may be added that the constitutional depression is greater in dysentery than in any affection which casually resembles it. Thus a person subject to bleeding piles may be attacked with colic, tenesmus, and a discharge of blood from the rectum. But there is wanting any marked derangement of the nervous system, of the circulation, or of the organs of primary digestion; besides which the history of the attack will reveal its special cause. The same remark is applicable to cases in which irritant substances, food, or poisons, have occasioned similar symptoms.

*Prognosis.*—The danger of dysentery depends chiefly upon its type. The mild form always terminates favorably under judicious treatment, the sthenic, and the bilious form, when simple, are those in which the method of treatment employed exerts the greatest influence on the rate of mortality which they occasion, and in which, therefore, the largest field is open for medical skill. Typhoid dysentery is the least amenable to treatment, and is the form to which the greatest ravages are attributable, as many as two-thirds of those attacked by it falling victims in certain epidemics. The mortality in proportion to the number attacked is always greatest at the commencement of an epidemic, as if the morbid cause were then most virulent; but the aggregate mortality continues to increase for some time in proportion to the number of persons attacked, and then as gradually declines with the extent as well as the virulence of the disease. The rate of mortality is always greater among those who remain in the place where an epidemic first breaks out, than among either those already sick or those

who are subsequently attacked, and who are removed to a more salubrious situation. This remark is founded upon the experience of all armies which have been visited by the disease. We may add that, other things being equal, it is more fatal in ordinary hospitals and barracks than in the better ventilated and less crowded field hospitals. It need scarcely be remarked that a previously good state of health is an important ground of a favorable prognosis, and that ill health, exhaustion by fatigue, scanty or innutritious food, or wounds, are equally unfavorable in their influence. Malarious influences aggravate the mortality in epidemics of dysentery both by their previously debilitating operation, and by their directly complicating the graver disease.

The special ground of a favorable prognosis is simply the original slighness or the regular subsidence of the characteristic symptoms. Of unfavorable indications the violence of the sthenic symptoms, in general, may be mentioned, but more particularly, the sudden or rapid decline of these symptoms, with a corresponding exhaustion of power. In the more or less typhoid cases, whether those originally having such a character, or acquiring it in the progress of the disease, the following may be regarded as indications of danger. Very frequent, fetid stools, resembling the washings of raw flesh, or dark and gangrenous in their odor; the sudden cessation of abdominal pain; repeated vomiting or hiccup, and paralysis of the sphincter ani; suppression of urine; dysphagia, a dark dry tongue, and aphthæ of the mouth; coldness of the extremities, the nose, or ears; petechiæ and vibices upon the skin; a dull and leaden countenance, and muttering delirium, weakness of the voice, complete aphonia, and paralysis of the lower limbs.

CAUSES. *Climate Season, &c.*—Almost all writers agree in stating that dysentery is much more common and fatal in hot than in cold climates, and doubtless this statement is true particularly in regard to the endemic disease. But it is neverthe-

less true that the prevalence of the disease in temperate climates is so great, at times, that of fifty-four notable epidemics of dysentery which are recorded as having prevailed in Europe and this country, all but eight occurred in localities where the winters are cold and the summers of moderate temperature. From the equator to the Arctic regions, there is no region where dysentery has not assumed the form of a destructive epidemic, and if fewer records of its ravages in hot climates exist, perhaps it is because the inhabitants are not accustomed to give their medical experience a place in their scanty literature.

The passage from summer to autumn is the season when dysentery is most prevalent. Of fifty recorded epidemics, thirty-six occurred at this period of the year. The most evident conditions for its generation are hot days and cool nights. It has been found to occur when these were apparently the only morbid influences; but frequently another atmospheric condition peculiar to that season of the year exists simultaneously, viz., moisture in the form of exhalations from the ground, or more commonly the precipitation of water from the air by its contact with the colder earth, or with the surface of rivers, ponds, &c.; in other words, cold fogs. By them the perspiration excited by the day's heat is suddenly checked, and the discharge of the effete results of decomposition from the skin, which the heat doubtless renders unusually active, abruptly ceases, the force of the recoil falls upon the organ which at the end of the summer is weakest, and probably finds an exit through the specific channels, the glands of the rectum and colon, which are the primary seat of organic change in dysentery. In all epidemics of dysentery occurring at the period here referred to, the disease begins to decline on the nearer approach of cold weather, and generally ceases to prevail by the month of November.

The frequent occurrence of dysentery in the autumn, and in localities where periodical fevers prevail, as well as the occasional union or alternation of the two affections in the same

person, has lent some color to the opinion that both forms of disease are due to the same poison or malaria. But if malaria is regarded as a simple agent, the doctrine is not only improbable but incredible. On the other hand, considering marsh miasm as a compound in which a specific poison fitted for generating periodical fevers is associated with the peculiar products of vegetable decomposition, their joint agency in the production of the two diseases becomes readily explicable. It is very certain that epidemic dysentery often exists where the fevers in question are unknown, but where the atmosphere is loaded with the exhalations of decomposing animal and vegetable substances; and on the other hand, that these fevers prevail quite independently of dysentery in malarious regions. Such facts are quite inconsistent with the hypothesis of a single morbid poison being the efficient cause of both diseases. It is further to be considered that miasmatic fevers induce a state of debility and impoverishment of the blood which must necessarily promote and intensify the operation of all the direct exciting causes of dysentery, and particularly of crude and unwholesome food and foul air; and consequently that, such conditions favoring, dysentery will be apt to prevail along with periodical fevers in camps and barracks, and similar aggregations of men, when sufficient attention is not paid to the cleanliness and ventilation of the tents, chambers, &c.

But, independently of any such predisposing cause as marsh miasm, the condition of large bodies of men may be impaired by other agencies, so as to render dysentery epidemic among them. To these its origin may be traced at seasons of the year when the cause in question does not operate—*e. g.* in midwinter. It is then, especially, that a neglect of hygienic measures is attended with the most fatal results; when the inclemency of the weather, prompting an effort to economize fuel, or to dispense with it, induces the poorer classes of citizens to shut out the air, as perfectly as possible, from their ill-built dwellings; and soldiers, crowded in tents, to supply, by their animal

heat, the warmth which they require. They forget, or do not know, that every moment they are generating a poison which contaminates the atmosphere, and probably clings to every fixed article within the dwelling, and sooner or later prostrates them as victims to typhus or to dysentery, or to both combined in one disease. It is a remarkable fact that the only place, in northern latitudes, where cholera raged as an epidemic in winter, was St. Petersburg—a city in which all the houses remain hermetically sealed during the cold season, and are heated by stoves in such a manner as almost entirely to prevent a renewal of the air. The history of typhoid dysentery is equally instructive, for it has always prevailed in crowded ships, and especially slavers; in prisons, barracks, besieged places, and camps, where men were crowded together, the air was imperfectly renewed, and the exhalations and excretions were allowed to mix with the atmosphere, and poison it; and when to these influences were added, as more direct and exciting causes, inclement weather, excessive fatigue, depressing emotions, intemperance, and insufficient or unwholesome food, and water either naturally impure, or rendered so by holding decaying matters in suspension. So influential does the last named cause become, even in ordinary civil life, that, as it has been shown in England, the population, in the districts which suffer the highest death-rates from bowel affections, breathes or drinks a large amount of putrefying animal refuse. Salt, or unsound provisions, and bad bread, are sometimes accused of producing dysentery, but they are insufficient causes, unless a predisposition is created by those which more profoundly and radically affect the economy, and particularly foul air and the vicissitudes of autumn and winter weather. If it were otherwise, dysentery in the army and navy would not be so generally confined to these two seasons, but would be coincident with faulty provisioning, which is confined to no season, but is most frequent in midwinter. A similar remark is applicable to the use of fruit. It is most abundant when dysentery is least prevalent, from May to Sep

tember; and all experience shows that some ripe fruits are valuable remedies in this disease. Undoubtedly, however, unripe fruit of any kind, or an excessive use of some species, such as melons and oranges with their pulp, also uncooked pears and apples, may become exciting causes of dysentery. Finally, it may be stated that sporadic dysentery can generally be traced to some exposure to cold and dampness, or to some error of diet, but that its epidemic form is quite as apt to occur without any definite exciting cause.

The *contagiousness* of dysentery has been both maintained and denied. The truth appears to be that its milder varieties are not contagious, but that its typhoid forms are highly so, and that its intermediate grades sometimes, however rarely, display this property. There is abundant evidence that the disease has been communicated by the dejections of the patients, by the privies or close stools they have used, and by the clothes they have worn or soiled. Numerous instances prove that the introduction of a single case of dysentery into a hospital has been followed by a diffusion of the disease among the patients; that the arrival of such a patient in a healthy neighborhood has been followed by the attack of persons in direct communication with him; that persons employed in the wards of those sick with dysentery have, without being themselves affected, carried the disease to their families; and, finally, that the attendants upon dysenteric patients, even when they did not contract the disease, exhibited its malignant influence in numerous subcutaneous abscesses and an eruption of sero-purulent blebs (rupia). These are sufficient reasons why, in the public service at least, the most scrupulous precautions should be taken, on the one hand, to prevent the concentration of dysenteric patients in close apartments, and, on the other, to restrict, as much as possible, their communication with other patients, or with persons who are still in health.

It is very doubtful whether dysentery attacks the same person twice. That it does so occasionally is probable; that

it does not do so frequently is certain. But there is still a question whether it is to be ranked in this respect with typhoid fever or with typhus, both of which are contagious, but the former protects from subsequent attacks as perfectly as small-pox, while the latter may occur in the same person an indefinite number of times.

TREATMENT.—Any attempt to describe the treatment of dysentery shows the propriety of studying the several forms of the disease, as has been done in this paper. Each of them requires a procedure which would be improper or insufficient in any other form. So extremely different are these methods, that while in simple dysentery the essential remedies are almost wholly negative, and the cure may be intrusted to nature alone, the efforts of nature are too often unavailing in the typhoid variety of the disease, and the vigorous intervention of art becomes imperatively necessary to combat the superadded or adventitious state of the system. The bilious phenomena which predominate in another variety would be aggravated by the appropriate remedies of the typhoid form, and in either of these the antiphlogistic method would be inappropriate, although it is sometimes urgently demanded in sthenic dysentery. Finally, the periodical form of dysentery calls for a separate and specific remedy. Nor is there any medicine which can with propriety be called anti-dysenteric; for although more than one has been vaunted as such, and has even seemed in certain epidemics to be endowed with specific powers, a more extended experience has dissipated the belief, and reduced it to a level with other remedies whose virtues are apparent only in particular stages or types of the disease.

*Treatment of Mild Dysentery.*—The first step should be to direct the patient to keep his bed, for rest is indispensable to the cure of every form of dysentery, and the next to restrict his food to the mildest farinaceous articles, and especially to rice water made thin, and strengthened by the addition of from one-

fourth to one-half of its quantity of milk. The drinks should consist of thin rice or barley water, gum water, etc. In many cases, this regimen, without any medicine whatever, will be sufficient for the cure. It may, however, be expedited by the administration of from half an ounce to an ounce of castor oil, or of from ten to twenty grains of calomel, followed in six or eight hours by the castor oil. Either dose may be repeated on the third day, or the calomel may be prescribed upon the first and the oil upon the third day, and should be given in the morning, so that its operation may be ended by evening, when a small opiate draught, of from five to fifteen drops of laudanum or of wine of opium, or from five to ten grains of Dover's powder, may be administered to promote rather than to enforce sleep, to allay tenesmus, and moderate the frequency of the stools.

If these measures are adopted from the first appearance of the dysenteric symptoms, they will generally arrest the attack in from three to six days; but if they are not employed until several days have elapsed they will be found less promptly efficient and must be repeated, the purges every second day and the mild opiates at night, until the tormina and tenesmus have ceased, or nearly so. When this point is reached acetate of lead in the dose of one grain, or of nitrate of silver in the dose of a quarter or one-half a grain, with one-sixth of a grain of opium, may be given every four or six hours in pilular form. But these remedies should at once be suspended or their dose diminished, if they appear to excite pain in the abdomen, or to increase the quantity of blood or mucus in the stools. After two or three days they should be gradually diminished in frequency of administration or in dose, and then suspended. In their place infusion of chamomile, quassia, or colombo may be prescribed until the appetite and digestive power have been restored.

As the frequency and the bloody appearance of the stools diminish, the food may consist of boiled milk and lime water

in the proportions of two-thirds of the former and one-third of the latter, with the addition of rice flour, arrowroot, sago, tapioca, or stale bread. The yolk of a fresh egg stirred in boiled and sweetened milk, pure or diluted, is nutritious and generally well digested. The return to solid food should be very gradual. It should be preceded by mutton or chicken broth thoroughly freed from fat, and taken in small quantities at a time. Thin tender mutton broiled quickly and not too much, may be cautiously substituted for the more liquid diet, and eaten with stale bread, or bread and butter.

*Treatment of Sthenic or Inflammatory Dysentery.*—The typical cases of this form of dysentery, as they have been described in the present paper, evidently call for a prompt treatment, and it might seem for strongly antiphlogistic measures. But the appearance of violence in the symptoms conveys an impression of power in them and in the patient, which the operation of such measures proves to be delusive; for under their use the strength is very apt to fail suddenly, and the disease to assume a low asthenic type. This effect is intelligible when we remember that dysentery is not a simple inflammation of the intestine, but a systemic disease of which the intestinal lesion is merely a local incident, and subordinate in its importance to the affection which involves the whole economy. Hence the apparently clear indication for venesection in the necessity of allaying the general violence of action and the local distress is calculated only to mislead, as it has done many physicians who afterwards abandoned it as mischievous. The abstraction of blood by cups or leeches near the seat of the local distress is, however, a palliative, but only a palliative, which should not be neglected, particularly when the region of the sigmoid flexure of the colon is very tender upon pressure, or the sensibility of the abdomen renders the existence of a peritonitis probable.

If the patient is robust and the pulse of good force and volume, saline laxatives constitute the most efficient and the promptest means of relief. Epsom salts, or still better, Rochelle

salts, in the proportion of one ounce of either to a quart of water of which a wineglassful is given every two hours, will generally in the course of a few hours diminish or even suspend entirely the tenesmus and produce a free discharge of bilious and watery stools. After this treatment has been pursued for eighteen or twenty-four hours it should be suspended for an equal space of time, and meanwhile doses of three or five grains of Dover's powder repeated at intervals of three hours, after which the saline may be resumed as at first. Two or three such courses are generally sufficient, and in the cases especially referred to constitute the most effectual palliative of the local distress, and the speediest cure of the disease. In the intervals between the courses of saline laxatives, weak chicken or mutton broth is generally well borne; but if not, the amylaceous preparations may be substituted. The copious use of rice water or barley water, or still better of rennet whey or of chicken water should be encourgaed.

If the patient is not of a vigorous constitution and is not affected with purely sthenic dysentery, purgative doses of calomel are preferable to the salines. These should be prescribed in the dose of twenty grains with a grain of opium in a single dose, or in two or three doses of from five to ten grains of calomel and one grain of opium in each, to be taken at intervals of six or eight hours, and followed, after a similar space of time, by an ounce of castor oil. Usually before the latter medicine is administered there is a marked abatement of the patient's sufferings and of the frequency of the stools, and the calomel has not to be repeated. Under this medicine the evacuations also change their character, and contain bile and feculent matter rather than blood. The remainder of the medical treatment may in general be confided to five grain doses of Dover's powder every five or six hours, or from three to five grains of ipecacuanha with half a grain or a grain of opium at like intervals; or, if the sthenic character of the symptoms be still decided, a grain of calomel may be added to each dose of either of the powders just referred

to. But such an addition is not generally advisable owing to the risk of inducing salivation. If the stools oblige the patient to rise frequently at night and so prevent his obtaining rest, a full dose of opium (one or two grains), or eight or ten grains of Dover's powder should be administered at bed time.

Enemata are useful in this form of dysentery, if in any acute form, of which there is serious doubt. If frequently repeated they are excessively annoying, and often appear to augment the irritability of the rectum. But occasionally and appropriately employed they serve to palliate the tenesmus, and the irritation of the organs adjacent to the rectum. For this purpose they may consist of half a pint of cold water or of tepid flaxseed tea according to the impression which the two make upon trial; or of two ounces of fresh melted lard or sweet oil; or finally of from twenty to sixty drops of laudanum in mucilage. The last should be given in very small bulk, not exceeding half a wineglassful. In the decline of the attack solutions of nitrate of silver (gr. ii to gr. v in a wineglassful of water), or the same quantity of liquid containing from five to fifteen drops of the diluted solution of subacetate of lead, may be used as enemata two or three times a day. Opiate suppositories, containing from one to three grains of opium, are sometimes preferable to injections.

Warm emollient poultices of Indian or flaxseed meal applied to the abdomen are very soothing, at least upon their first application, and may be rendered more so by being made with the liquor from a decoction of hops, or by being moistened with laudanum. Woollen cloths wrung out of hot water and sprinkled with oil of turpentine form a very useful epithem for the same purpose; and liniments of camphorated oil and chloroform are not without their advantages. If such applications as these fail of giving relief, a blistering plaster over the seat of pain will generally succeed. It should not remain applied longer than three or four hours, after which time vesication will readily occur under a warm poultice or even a dressing of simple cerate.

When the acute symptoms have all declined, and the number of stools has fallen considerably, and they no longer contain mucus or blood, all other medicines may be laid aside in favor of acetate of lead and opium, of which one grain of the former and half a grain of the latter may be administered every three, four, or five hours, the intervals between the doses being gradually lengthened as the frequency of the discharges diminishes and their consistence increases. This combination is greatly superior in efficacy to any preparation whatever of vegetable astringents. If, as sometimes happens, it occasions scybalous dejections, it should be suspended for a day, and a small dose, of perhaps half an ounce of castor oil, administered to cleanse the colon. If, after this, loose stools continue, the lead should be resumed, but not otherwise.

The cautions in regard to diet during convalescence need not be repeated here, but it may be remarked that they ought to be most sedulously observed in this graver form of dysentery.

*Treatment of Bilious Dysentery.*—The characteristic symptoms of bilious dysentery, it will be remembered, indicate derangement of the stomach and liver, either with active inflammatory symptoms, but less so than in the last form, or showing a tendency towards an adynamic condition of the system. The peculiarity of the treatment which it requires is, that while evacuants are not less important than in sthenic dysentery, emetics take precedence of purgatives. If the patient is early seen, twenty or thirty grains of ipecacuanha should be administered, and its operation, when once fairly begun, should be assisted with copious draughts of warm barley water. The relief afforded by this evacuant is sometimes very decided. It should be followed, as soon as the stomach is settled, with a mild saline laxative largely diluted, such as half an ounce or an ounce of Rochelle salts, or of cream of tartar in a pint of water, of which a wineglassful may be administered every two hours, with four or five drops of wine or of tincture of opium.

It is well known that ipecacuanha when first introduced into

European practice was held to be a specific for dysentery, for it was so considered in South America, whence it came. It was then employed as follows: Two drachms of the bruised root were infused over night, or else boiled in four ounces of water, which were administered early in the morning to the patient fasting. This dose, prepared from the same portion of ipecacuanha, was repeated for two or three consecutive days. We are assured that it strengthened rather than debilitated. Quite recently we learn that the remedy is still regarded as a specific in Peru, and that it should be prescribed in the following manner. From half a drachm to a drachm of powdered ipecacuanha mixed with a little syrup and water is given early in the morning, and the patient is directed to lie quietly and to avoid drinking anything to excite vomiting. Night and morning an enema is administered of the infusion of bruised ipecacuanha in twenty-four ounces of water to which one ounce of "syrup of morphia" is added. The powder and the enema are thus employed for three or four successive days. Little vomiting is produced, but the second or third dose causes copious bilious stools, which is the proposed effect of the medicine. When this is accomplished, an ounce or two of castor oil is exhibited, and when it has ceased to operate, the evacuant treatment is ended. The cure may then be intrusted to mild astringents and opiates. If the case is too urgent to admit of the delay necessary for the systematic plan here indicated, it is advised to administer ten grains of powdered ipecacuanha and one grain of opium every six or eight hours, and the enema above described, night and morning, until the urgent symptoms are arrested. (WHITTINGHAM, *Am. Journ. of Med. Sci.*, Oct. 1860, p. 381.)

Instead of seeking either the emetic or the specific operation of ipecacuanha alone, we may obtain its peculiar benefits through the emeto-cathartic effect of ipecacuanha and calomel together, by administering twenty grains of the former with ten or fifteen grains of the latter. On the next day the saline

solutions already recommended, and on the following day the calomel alone may be repeated, or, if the gastric disturbance still forms a prominent symptom, the ipecacuanha also. But this method is applicable chiefly in the forming stage of the attack, at which time, if the evacuant operation is thorough, the further progress of the disease may be arrested or rendered very mild. Its use, however, should be restricted to cases in which the constitutional vigor is but slightly impaired.

We cannot have too strongly impressed upon the mind that calomel, invaluable though it be on account of its gentleness as a purgative and its specific operation on the liver, may nevertheless expose the patient to danger by its primary depressing influence, and by the possibility of its occasioning salivation, or by the other and remoter effects of mercurial poisoning. In the decidedly sthenic variety of dysentery, the danger of these accidents is, indeed, very slight; and even in the bilious form they are comparatively small, if the medicine is used as a purgative only: but in either form they are greatly increased by the vicissitudes of military life. It, therefore, becomes the duty of the army surgeon not to employ mercury in large or in small doses unless simpler remedies have proved inefficacious in other cases of the disease. When in doubtful cases it has been prescribed, its sojourn in the system should be prevented by the timely administration of castor oil or saline laxatives.

It may not be amiss to remark that ipecacuanha in the small dose of one grain every four or six hours, has been proclaimed as a specific for all the active forms of dysentery. A larger dose than this occasions so much distress from nausea as to render it ineligible for repetition.

In bilious dysentery the premature exhibition of opiates is to be sedulously avoided, because they check the secretion of bile which it is desirable, on the contrary, to promote. But when once bilious evacuations have been procured, the administration of small doses of wine of opium or of Dover's powder

may be cautiously resorted to for allaying pain and lessening the discharges.

In this variety of the disease, even more, perhaps, than in the purely inflammatory form, a diet composed in part of acidulous drinks, is grateful to the patient. The pulp either of roasted apples, or of ripe grapes, has been found peculiarly serviceable; and in no other description of dysentery is butter-milk more eagerly taken by those who are used to it as a drink, and sometimes by those who are not. We have carried many cases of simple and of asthenic dysentery to a safe issue with no other medicine or food than this acidulous and nutritious liquid. Panado may likewise be mentioned here as a form of nourishment adapted to all the active forms of the disease. It is made as follows: Take an ounce of stale wheat bread, and pour on it a pint of boiling water. When the mixture has stood for an hour, beat it up and boil it for ten minutes. It may then be sweetened, and flavored with a little wine and cinnamon, or nutmeg. The above mentioned varieties of food may be alternated with diluted milk and farinaceous articles, and rennet whey may be freely taken as a drink. As the symptoms subside mutton tea made from the lean meat, and freed from fat still further by skimming, may be allowed with stale bread or rice; but solid food, as in the other forms of the disease, is very gradually and cautiously to be resumed.

*Treatment of Malignant or Typhoid Dysentery.*—This affection, in its worst form, that is, when besides the typhoid state it is complicated with scurvy, is but little, if at all, amenable to medical treatment. It was this form of dysentery, which, like a pestilence, ravaged the British army in the Crimea, and of whose treatment the official report to Parliament holds the following language: "The medical officers of the army were unanimous in their opinion of the inadequacy of mere drugs in the treatment of these affections, and in the numerous reports which we have consulted, almost every medicine is mentioned either with disrespect, or in terms of very sparing com-

mendation; but of those which are most favorably alluded to—opium and the combination of gray powder [mercury with chalk], ipecacuanha, the mineral acids, and the preparations of iron seem to have enjoyed the greatest degree of confidence; charcoal also was administered in some regiments, alone and in combination with camphor, with apparent advantage, and quinine was early resorted to on account of the periodic nature of these affections in some instances; but no decided testimony to its usefulness can be procured, and it was more often prescribed only in the convalescent stages. During the early period of the siege, of all the remedies which were had recourse to the most constantly in use were the astringents, vegetable and mineral, and of these by far the most valuable in the general estimation was opium, for it served to induce sleep (an important consideration), to moderate the intestinal discharges, sustain the capillary circulation, and to give tone to the smaller vessels, it required, however, to be used with caution, and if pushed too far, it lowered the circulation and predisposed to gangrene in the parts most distant from the heart; the other astringents were of doubtful merit and soon sank into disrepute; for though in some cases, when diarrhoea seemed to have degenerated into a habit, from mere want of tone and elasticity in the system, they might have proved useful in controlling the flux, yet . . . it will appear extremely questionable whether these remedies were not, in most cases, of doubtful application, and whether they may not sometimes have proved injurious by suddenly and forcibly arresting the course of the flux, and thus precipitating the patient into a reactionary febrile state. Upon this point, however, it is obvious that every observer will have formed his own opinion, and we shall, therefore, only further remark, that in our own experience, that which the strongest styptics were only able to control for a few hours, and with great inconvenience, nay, often much pain to the patient, a few days on a diet of rice milk, of potatoes and essence of beef, sufficed to arrest; and we were, therefore, forced to conclude, that these

affections, in their primary design, were conservative of nature, and that they were only to be successfully and safely combated, by removing the necessity of such a drain from the system, and introducing into the circulation the elements of healthy blood—good food; and of healthy sanguification—pure air, &c.”

The report goes on to remark that when the diarrhœa was marked by the appearance of undigested aliment (salt meat) in the dejections, lime juice was found a very useful remedy, and also when the bowel complaints were associated with a scorbutic taint of the system. It was administered two or three times a day, in doses ranging from one to three ounces, with sugar and water. Even in diarrhœa of the more severe or dysenteric character, it never proved injurious if exhibited in barley or rice water, and in combination with opium. It is to be borne in mind that the scorbutic element which the lime juice was employed to correct can never present itself if the soldiers receive a proper supply of fresh meat and vegetables, and due attention is paid to their hygienic condition.

The views and precepts here presented are in full confirmation of those contained in the writings of all the eminent physicians in Europe, whether British or continental, who have treated of this subject. It may be added that these writers are equally agreed in regard to the value of external stimulant applications to the abdomen, such as spice plasters, sinapisms, and particularly turpentine stupes made by sprinkling spirits of turpentine upon woollen cloths wrung out of hot water. When the condition of the patient does not contra-indicate the use of blisters, their application to the abdomen during a period of from three to six hours is often of essential service. If the skin is very harsh and dry, it should be frequently sponged with chlorinated water or with vinegar. Alcoholic drinks, although they may appear to be indicated by the extreme prostration of the patient, must be very cautiously prescribed, for however they may tend to rouse his flagging energies, they are also, by continued use or in large quantities, very apt to exhaust the vital powers. A

similar danger, it has already been stated, attends the use of opium. The decoctions of Peruvian bark and Huxham's tincture are preferable to quinia, when a tonic and not an anti-periodic operation is intended. Camphor, valerian, serpentaria, ammonia, and also turpentine have been recommended as internal stimulants, but they are ineligible because they tend to disorder the stomach and irritate the bowels. Perhaps the only medicinal substance besides opium which is appropriate for internal use in this form of dysentery is nitrate of silver. It may be prescribed in doses of one or two grains, and in pilular form, every four hours, until a change in the quality or the frequency of the discharges takes place. Although this remedy is not so efficacious in the extreme cases of the variety of dysentery under consideration as when the vigor of the constitution is less completely undermined and the character of the disease is simpler, it has the advantage of being perfectly innocuous in the doses which are here advised.

But whatever medicines and whatever varieties of food may be employed to combat the dysenteric, the typhoid, or the scorbutic element of the disease, they will be of little avail unless their influence is sustained by appropriate hygienic measures, and particularly by a change of air. A constant renewal of the air is an essential element of the cure wherever dysenteric patients are treated, and it is, if possible, more imperatively necessary when the form of the disease is the one at present under consideration. But no degree of ventilation in the tents or wards occupied by the sick in the locality where the disease broke out, will equal in efficiency their removal to a more salubrious situation.

*Treatment of Periodical Dysentery.*—Dysentery complicated with periodical fever is amenable to quinia in proportion to the predominance of the periodical type, that is to say, in proportion to the distinctness with which there is a freedom from all active symptoms in the periods between the paroxysms. When the suspension of these symptoms is most complete, quinia alone

will frequently, indeed generally, suffice to terminate the complex disease; when, however, the dysenteric phenomena persist between the periodical exacerbations, quinia may arrest the latter without materially influencing the former. A compound treatment then becomes necessary, in which, if gastric derangement is present, an emetic dose of ipecacuanha and calomel (twenty grains of the former to ten or fifteen of the latter) should be premised, and, when its operation has ceased, quinia may be prescribed in solution, in the dose of from three to five grains every three or four hours, guarded by four or five drops of laudanum in each dose, or accompanied by two or three grains of Dover's powder. If there is no disorder of the stomach the emetic of ipecacuanha may be omitted at the commencement of the treatment, and castor oil be substituted for the calomel. When the periodical character of the disease has disappeared, the dysenteric symptoms, if any continue, should be managed in the manner already laid down, and in accordance with the grade and type which they then present.

*Treatment of Chronic Dysentery.*—Appropriate diet and regimen are essential to, and often sufficient for, the cure of this affection, provided that permanent organic alterations of the colon or rectum have not been established. Hence the urgent necessity of withholding from the patient his ordinary food when this is coarse and too abundant, and from his usual occupations when they involve undue fatigue or exposure. The most useful form of diet is milk with bread or other mild farinaceous preparations, especially rice, and a gradual and cautious return to solid food, consisting of mutton, beef, or poultry, in very small quantities at a time. Many cases are cured by lime water and boiled milk, in equal parts, with the addition of biscuit, if tender, or softened by hot water and slightly salted if it is hard and stale. Both bread and biscuit, if toasted, are thereby rendered more agreeable to the taste and more digestible. Soups are generally ineligible, for they are apt to occasion flatus, griping, and an increased frequency of the discharges. It is of

the utmost importance that the drinking water should be of good quality. If it contain any appreciable amount of vegetable or mineral matter it should be purified by boiling. While moderate exercise in fair weather promotes the cure, fatigue is to be avoided, and suitable clothing, especially a flannel shirt, should be prescribed as essential. In warm weather sea bathing, if not unduly prolonged, is of decided service.

The medicinal treatment of chronic dysentery demands great circumspection and judgment, to adapt it to the peculiarities of each particular case. If the irritability of the bowels is very great, indicating, probably, a certain degree of inflammatory action, warm fomentations of the abdomen, opium in small doses, and nitrate of silver or acetate of lead, should be employed. The dejections ought to be frequently inspected, and if found to contain scybala, half an ounce of castor-oil, or ten or fifteen grains of rhubarb, either alone, or with about five grains of blue mass, should be prescribed. In more atonic forms, nitrate of silver and acetate of lead are still the most useful remedies of their class, and next to them sulphate of copper ranks; but with all, the association of a small proportion of opium is advisable. Among remedies of this kind, balsam of copaiva is one of the most valuable. In these, as well as in the preceding form of chronic dysentery, blisters to the abdomen may be resorted to with decided advantage, provided the strength of the patient is not very greatly reduced; but they should not remain applied long enough to produce a suppurating surface. If the appetite is feeble, and digestion imperfectly performed, the bitter vegetable tonics are indicated, as cinchona, colomba, simaruba, and angustura, the last two of which are reputed to have a specific virtue in dysentery. Angustura is even held to possess peculiar advantages in the low forms of the acute disease. It is important that the decoction or infusion of these bitters should not be unduly strong. Finally, when anemia complicates the disorder of the bowel, and bitter vegetable preparations fail to invigorate digestion,

iron should be prescribed, and particularly the preparations which possess a marked astringency, as the muriated tincture, the persesquinitrate, and the perchloride. These remedies may be appropriately alternated with the vegetable bitters.

If the local irritation about the rectum continues, so as to occasion tenesmus, it may be palliated by leeches around the margin of the anus, by the application of warm narcotic vapors, or warm hip-baths; by injections or suppositories of opium or belladonna, or by the injection of a solution of nitrate of silver, containing from one to five grains of the salt, to an ounce of water. On the other hand, if a relaxed atonic condition of the anus exists, it should be treated with cold hip-baths and cold astringent injections, particularly such of the latter as contain the acetate or subacetate of lead. The tincture of *nux vomica* or *strychnia*, may be administered internally, the former in the dose of five drops, gradually augmented, and the latter, in the dose of one-twentieth of a grain, cautiously increased. *Strychnia* has also been inoculated in the neighborhood of the anus, when the sphincter has lost its power, and there is more or less prolapse of the rectum.

OF THE PREVENTION OF DYSENTERY IN CAMPS, &c.—This subject may be considered, 1, in relation to the means to be employed for preventing the occurrence of the disease; and 2, in relation to those which are adapted to lessen its malignity, and oppose its extension, where it has already broken out. The ample instructions furnished by the publications of this Commission in regard to the sanitary regulations of camps and hospitals, render it unnecessary to lengthen the present paper by any details upon either branch of the subject. It will be sufficient to remark that dysentery is most efficiently prevented by dryness and purity of the air; the absence of malarious and putrescent effluvia; warm clothing; the avoidance of the hot mid-day sun, and of chill by night air, or sleeping on the damp ground: by active exercise, to promote warmth,

rather than by trusting to artificial heat, and therefore by games and sports, as well as by frequent drill; by camp fires, to dry the clothing in damp weather, and by stoves, to dry the tents, rather than to heat them. In summer, the men should be obliged to bathe frequently, and at all times to observe the most perfect personal cleanliness.

The food should always be composed of a large proportion of fresh vegetable matter, and the utmost care taken to render it both palatable and digestible, by appropriate cooking, an art the most neglected and rudimentary among us, even in civil life, and in times of peace and plenty. If the drinking water is not pure, it should, as already remarked, be boiled before being used; and this precaution against the mischievous effects of vegetable and mineral impurities, is of the first necessity in the treatment of the sick. Alcoholic drinks should be used sparingly; intemperance is the direct road to the hospital.

If dysentery have already broken out, the essential conditions for staying its progress, is a removal to a healthier locality; if this cannot be done, then the most important element of cure is fresh air. So essential is it, that cold is of secondary consequence in comparison. All observation teaches that the sick with this disease, and with typhus, and some other affections, are much more apt to recover in tents, or other imperfectly closed habitations, than in well built hospitals. In the latter, but indeed everywhere, the utmost care should be given to prevent other persons from using as a privy the place frequented by dysenteric patients. The fecal matter should either be removed at once, or its emanations prevented by the addition to it of quicklime.

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